

Symbolic Logic
Practice using the Laws of Inference

Name *KEY*

These are one-steppers. For each situation, draw a conclusion and then name the Law of Inference that you are applying.

$$\begin{array}{l} 1. \ p \rightarrow q \\ \quad \sim q \\ \hline \end{array}$$

$\therefore \sim p$
reason: *L of Contrapositive Inference*

$$\begin{array}{l} 8. \ \sim q \rightarrow r \\ \quad \sim r \\ \hline \end{array}$$

$\therefore q$
reason: *L of Contrapositive Inference*

$$\begin{array}{l} 2. \ p \rightarrow q \\ \quad q \rightarrow r \\ \hline \end{array}$$

$\therefore p \rightarrow r$
reason: *L of Syllogism*

$$9. \ \sim(a \vee b) \quad \dots$$

$\therefore \sim a \wedge \sim b$
reason: *De Morgan's Law*

$$3. \ a \wedge b$$

$\therefore a \text{ or } b$
reason: *L of Simplification*

$$\textcircled{10.} \ \begin{array}{l} \sim x \vee \sim y \\ \quad y \\ \hline \end{array}$$

$\therefore \sim x$
reason:

$$4. \ \begin{array}{l} \sim a \rightarrow b \\ \quad \sim a \\ \hline \end{array}$$

$\therefore b$
reason: *L of Detachment*

$$11. \ c \wedge d$$

$\therefore c \text{ or } d$
reason: *L of Simplification*

$$5. \ \begin{array}{l} \sim p \vee q \\ \quad \sim q \\ \hline \end{array}$$

$\therefore \sim p$
reason: *L of disjunction Inference*

$$12. \ \begin{array}{l} \sim(\sim a) \rightarrow b \\ \quad a \\ \hline \end{array}$$

$\therefore b$
reason: *L of Detachment*

$$6. \ \sim(p \wedge q)$$

$\therefore \sim p \vee \sim q$
reason: *De Morgan's Law*

$$7. \ \sim r \wedge \sim s$$

$\therefore \sim(r \vee s)$
reason: *De Morgan's Law*